

CLAIMS

1. A semiconductor device comprising:  
a semiconductor chip on which a plurality of electrodes  
5 are formed;

a first flexible substrate on which a wiring pattern is  
formed and on which the semiconductor chip is mounted;

a plurality of external terminals electrically connected  
to the electrodes with the wiring pattern interposed; and

a second flexible substrate adhered to the first flexible  
substrate avoiding the semiconductor chip.

2. The semiconductor device as defined in claim 1,  
wherein the first and second flexible substrates are of  
15 the same material and of substantially the same thickness.

3. The semiconductor device as defined in claim 1,  
wherein the wiring pattern is disposed to face the second  
flexible substrate; and

20 wherein a plurality of through holes are formed in the  
first flexible substrate;

wherein the external terminals are provided to be  
connected with the wiring pattern via the through holes; and

25 wherein the external terminals project from a surface of  
the first flexible substrate opposite to a surface on which the  
wiring pattern is formed.

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4. The semiconductor device as defined in claim 3, further comprising:

5 a conductive layer which is formed between the first and second flexible substrates, of the same material and of substantially the same thickness as the wiring pattern, and is electrically insulated from the wiring pattern.

5. The semiconductor device as defined in claim 4,

10 wherein the means of adherence of the first flexible substrate and the wiring pattern, and the means of adherence of the second flexible substrate and the conductive layer are the same.

6. The semiconductor device as defined in claim 4,

15 wherein the conductive layer is of a symmetrical form with the wiring pattern.

7. The semiconductor device as defined in claim 4,

20 wherein a first insulating film is formed on a surface of the wiring pattern opposite to the first flexible substrate; and

wherein a second insulating film is formed on a surface of the conductive layer opposite to the second flexible substrate.

25 8. The semiconductor device as defined in claim 3,

wherein the electrodes of the semiconductor chip are

electrically connected to the wiring pattern by an anisotropic conductive material having electrically conductive particles dispersed in an adhesive; and

wherein the first and second flexible substrates are  
5 adhered to each other by the anisotropic conductive material.

9. The semiconductor device as defined in claim 3,  
wherein the first and second flexible substrates are  
adhered to each other by a resin; and

10 wherein the resin is provided on a surface of the first  
flexible substrate on which the wiring pattern is formed, and  
is in close contact with a surface of the wiring pattern facing  
the second flexible substrate and edge surfaces of the wiring  
pattern.

15 10. A circuit board on which is mounted the semiconductor  
device as defined in <sup>Claim 1</sup> ~~any of claims 1 to 9~~.

9 11. An electronic instrument having the semiconductor device  
20 as defined in <sup>Claim 1</sup> ~~any of claims 1 to 9~~.

12. A method of manufacture of a semiconductor device  
comprising the steps of:

25 providing a semiconductor chip which has a plurality of  
electrodes, a first flexible substrate on which a wiring pattern  
is formed, and a second flexible substrate;

mounting the semiconductor chip on the first flexible

substrate;

adhering the second flexible substrate to a portion of the first flexible substrate avoiding a region in which the semiconductor chip is mounted; and

5 providing external terminals electrically connected to the electrodes with the wiring pattern interposed.

13. The method of manufacture of a semiconductor device as defined in claim 12, further comprising:

10 a step of punching out the first and second flexible substrates after the step in which the second flexible substrate is adhered.

14. The method of manufacture of a semiconductor device as defined in claim 13,

wherein the first and second flexible substrates are in tape form;

wherein the wiring pattern is repeatedly formed on the first flexible substrate; and

20 wherein a hole is formed repeatedly on the second flexible substrate to avoid the semiconductor chip.

15. The method of manufacture of a semiconductor device as defined in claim 12, further comprising:

25 a step of punching out the first flexible substrate avoiding the second flexible substrate after the step in which the second flexible substrate is adhered.

16. The method of manufacture of a semiconductor device as defined in claim 15,

wherein the first flexible substrate is in tape form;

5 wherein the second flexible substrate is formed to be smaller than a region punched out in the first flexible substrate;

wherein the wiring pattern is formed repeatedly on the first flexible substrate; and

10 wherein a hole is formed in the second flexible substrate so as to avoid the semiconductor chip.

17. The method of manufacture of a semiconductor device as defined in claim 12,

15 wherein the step of mounting the semiconductor chip is carried out after the step of adhering the second flexible substrate.

18. The method of manufacture of a semiconductor device as defined in claim 12,

20 wherein the step of adhering the second flexible substrate is carried out after the step of mounting the semiconductor chip.

25 19. The method of manufacture of a semiconductor device as defined in claim 18,

wherein the step of mounting the semiconductor chip

includes a step of providing an anisotropic conductive material having electrically conductive particles dispersed in an adhesive on the first flexible substrate, exceeding a region of mounting the semiconductor chip, and a step of electrically  
5 connecting the electrodes to the wiring pattern with the anisotropic conductive material interposed; and

wherein the second flexible substrate is adhered to the first flexible substrate by the anisotropic conductive material in the step of adhering the second flexible substrate.

10 20. The method of manufacture of a semiconductor device as defined in claim 17,

wherein the step of adhering the second flexible substrate includes:

15 a step in which a resin is applied to at least one of the first and second flexible substrates; and

a step in which the first and second flexible substrates are brought into close contact with the resin interposed to bring the resin into close contact with a surface of the wiring  
20 pattern facing the second flexible substrate and edge surfaces of the wiring pattern.

21. The method of manufacture of a semiconductor device as defined in claim 18,

25 wherein the step of adhering the second flexible substrate includes:

a step in which a resin is applied to at least one of the

first and second flexible substrates; and

a step in which the first and second flexible substrates are brought into close contact with the resin interposed to bring the resin into close contact with a surface of the wiring pattern facing the second flexible substrate and edge surfaces of the wiring pattern.

22. The method of manufacture of a semiconductor device as defined in <sup>Claim 12</sup> ~~any of claims 12 to 21~~,

10 wherein positioning holes are formed in one of the first and second flexible substrates and positioning marks are formed in the other; and

wherein the holes and the marks are aligned for positioning the first and second flexible substrates.

23. The method of manufacture of a semiconductor device as defined in <sup>Claim 12</sup> ~~any of claims 12 to 21~~,

15 wherein the second flexible substrate is formed of the same material and of the same thickness as the first flexible substrate.

24. The method of manufacture of a semiconductor device as defined in <sup>Claim 12</sup> ~~any of claims 12 to 21~~,

25 wherein a conductive layer of the same material and of the same thickness as the wiring pattern is formed on the second flexible substrate; and

wherein the conductive layer and the wiring pattern are

disposed to face to each other and are made electrically insulated from each other; and

wherein the second flexible substrate is adhered to the first flexible substrate.

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25. The method of manufacture of a semiconductor device as defined in claim 24,

wherein the conductive layer is of a symmetrical form with the wiring pattern.

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26. The method of manufacture of a semiconductor device as defined in claim 24,

wherein a first insulating film is formed on the wiring pattern of the first flexible substrate; and

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wherein a second insulating film is formed on the conductive layer of the second flexible substrate.

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